

REMARKS

Claim 1 and 12-15 have been amended. Claims 2-11 and 16 remain in the application.

I. Provisional Double Patenting Rejection re: 10/078,778

(Atty docket No. PU020026, filed 02/19/2002)

The examiner provisionally rejected claims 1-4 and 6-17 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-12 of copending Application No. 10/078,778. Although the conflicting claims are not identical, the office action states the claims are not patentably distinct from each other because they both claim:

- 1.) a circuit for reducing adjacent pixel interdependence in a liquid crystal display comprising:
- 2.) a decomposer;
- 3.) a circuit for reducing adjacent pixel interdependence;
- 4.) a delay match circuit and combining means.

Claimed Invention

Amended apparatus claim 1 of the present case recites:

A circuit for reducing declination errors in a liquid crystal display, comprising:
a decomposer for dividing an input signal into a plurality of signals **having at least high, medium and low brightness signals**;
at least one transient conditioner circuit including an anticipatory portion and a reactive portion for limiting signal transients between brightness levels in at least one of said medium and low brightness signals;
a delay match circuit for said high brightness signal; and,
means for combining the delayed high brightness signal with said **at least one signal transient processed brightness signal** to provide an output signal, wherein said output signal has reduced sparkle artifacts.

Amended method claim 12 of the present application recites:

A method for reducing declination errors in a liquid crystal display, comprising the steps of:
dividing an input signal into **at least high, medium and low brightness signals**;

limiting ,including an anticipatory limiting step and a reactive limiting step, signal transients between brightness levels of at least one of said medium and low brightness signals;
delay matching the high brightness signal; and,
combining said at least one limited brightness signal and said delayed high brightness signal to form an output signal having reduced sparkle artifacts.

Cited co-pending patent claims

Apparatus claim 1 of the cited co-pending Application No. 10/078,778, recites:

- 1: A circuit for reducing adjacent pixel interdependence in a liquid crystal display, comprising: a decomposer for dividing an input signal into a plurality of signals having at least a high brightness signal and a low brightness signal; a split low pass filter arrangement for independently low pass filtering rising transients and falling transients in said low brightness signal to reduce adjacent pixel interdependence; a delay matching circuit for the high brightness signal; and means for combining the delayed high brightness signal with the filtered low brightness signal to provide an output with reduced sparkle artifacts.

Method claim 9 of the cited co-pending Application No. 10/078,778, recites:

9. A method for reducing adjacent pixel interdependence in a liquid crystal display, comprises the steps of: dividing an input signal into at least a high brightness signal and a low brightness signal; independently low pass filtering rising transients and falling transients in said low brightness signal to reduce adjacent pixel interdependence; delay matching the high brightness signal with said filtered low brightness signal; and, combining the delay matched high brightness signal and the filtered low brightness signal to provide an output signal with reduced sparkle artifacts.

Applicant respectfully submits there is recited in amended claims 1 and 12 of the present application at least one feature that is not explicitly or implicitly recited, suggested, taught, or described in any of the claims of the cited co-pending patent application, such that an obviousness type double patenting rejection could be sustained.

Specifically, there is no teaching or suggestion in the cited co-pending claims, nor would it be obvious to one of ordinary skill in the art, upon reading these claims, to:

divide an input signal into at least high, medium and low brightness signals, and limit, including an anticipatory limiting step and a reactive limiting step, signal transients between brightness levels of at least one of said medium and low brightness signals.

Applicant's present specification teaches this unobvious feature in the specification, for example, on page 8 lines 9-25, and page 9 lines 1-4.:

"As shown in the embodiment of FIG. 1, the input signal is optionally divided into three (3) signals including a high brightness signal (H), a medium brightness signal (M), and a low brightness signal (L). When the input signal is divided into three signals, two threshold signals (Tu and Tl) are preferably used by the decomposer 12."

"When the input signal is divided into more than two signals, the "lower" brightness signals (M and L in FIG. 1) are preferably processed using additional transient circuits as needed. In the embodiment shown in FIG. 1, the low brightness signal (L) is processed using the transient conditioner 18 to provide a processed low brightness signal and a second transient conditioner circuit 16 processes the medium brightness signal to provide a processed medium brightness signal. The transient conditioners preferably comprise an anticipatory portion and a reactive portion. The transient conditioner circuits preferably comprise at least one recursive slew rate limiter for limiting dark going transients and at least one finite response pre-conditioner for limiting bright going transients as will become apparent with reference to FIG. 2. The recursive slew rate limiter is the reactive portion and the finite response pre-conditioner is the anticipatory portion."

Applicant's co-pending claims lack any teaching or suggestion of a transient conditioner.

Accordingly, Applicants respectfully request the withdrawal of the non-statutory double patenting rejection and allowance of the claims as amended herein.

II. Provisional Double Patenting Rejection re: 09/803,249

(Atty Docket No. PU010047, filed 3/9/2001)

The examiner provisionally rejected claims 1-4 and 6-17

under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-25 of co-pending Application No. 09/803,249. Although the conflicting claims are not identical, the office action states they are not patentably distinct from each other because they both claim

a circuit for reducing adjacent pixel interdependence in a liquid crystal display comprising
a decomposer;

a circuit for reducing adjacent pixel interdependence;
a delay match circuit and
combining means.

Claimed Invention

Amended apparatus claim 1 of the present case recites:

A circuit for reducing declination errors in a liquid crystal display, comprising:
a decomposer for dividing an input signal into a plurality of signals **having at least high, medium and low brightness signals;**
at least one transient conditioner circuit including an anticipatory portion and a reactive portion for limiting signal transients between brightness levels in at least one of said medium and low brightness signals;
a delay match circuit for said high brightness signal; and,
means for combining the delayed high brightness signal with said **at least one signal transient processed brightness signal** to provide an output signal, wherein said output signal has reduced sparkle artifacts.

Amended method claim 12 of the present application recites:

A method for reducing declination errors in a liquid crystal display, comprising the steps of:
dividing an input signal into **at least high, medium and low brightness signals;**
limiting ,including an anticipatory limiting step and a reactive limiting step, signal transients between brightness levels of at least one of said medium and low brightness signals;
delay matching the high brightness signal; and,
combining said at least one limited brightness signal and said delayed high brightness signal to form an output signal having reduced sparkle artifacts.

Cited co-pending patent application

Applicant respectfully submits there is recited in amended claims 1 and 12 of the present application at least one feature that is not explicitly or implicitly

Amdt. dated 8/11/2004

Reply to Office action of 2/11/2004

recited, suggested, taught, or described in any of the claims of the cited co-pending patent application, nor can any teaching be found in the specification of the cited co-pending application, such that any obviousness rejection based upon the cited co-pending application could be sustained.

Specifically, there is no teaching or suggestion anywhere in the cited co-pending application, nor would it be obvious to one of ordinary skill in the art, upon reading the co-pending application, to:

divide an input signal into **at least high, medium and low brightness signals, and limit, including an anticipatory limiting step and a reactive limiting step, signal transients** between brightness levels of at least one of said medium and low brightness signals.

Applicant's present specification teaches this unobvious feature in the specification, for example, on page 8 lines 9-25, and page 9 lines 1-4.:

"As shown in the embodiment of FIG. 1, the input signal is optionally divided into three (3) signals including a high brightness signal (H), a medium brightness signal (M), and a low brightness signal (L). When the input signal is divided into three signals, two threshold signals (Tu and Tl) are preferably used by the decomposer 12."

"When the input signal is divided into more than two signals, the "lower" brightness signals (M and L in FIG. 1) are preferably processed using additional transient circuits as needed. In the embodiment shown in FIG. 1, the low brightness signal (L) is processed using the transient conditioner 18 to provide a processed low brightness signal and a second transient conditioner circuit 16 processes the medium brightness signal to provide a processed medium brightness signal. The transient conditioners preferably comprise an anticipatory portion and a reactive portion. The transient conditioner circuits preferably comprise at least one recursive slew rate limiter for limiting dark going transients and at least one finite response pre-conditioner for limiting bright going transients as will become apparent with reference to FIG. 2. The recursive slew rate limiter is the reactive portion and the finite response pre-conditioner is the anticipatory portion."

Accordingly, Applicants respectfully request the withdrawal of the non-statutory double patenting rejection and allowance of the claims as amended herein.

III. Provisional Double Patenting Rejection re: 09/803,485

(Atty Docket No.PU010032, filed 3/9/2001)

The examiner provisionally rejected claims 1-4 and 6-17 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-29 of co-pending Application No. 09/803,485. Although the conflicting claims are not identical, the office action states they are not patentably distinct from each other because they both claim: a circuit for reducing adjacent pixel interdependence in a liquid crystal display comprising a decomposer; a circuit for reducing adjacent pixel interdependence; a delay match circuit and combining means.

Claimed Invention

Amended apparatus claim 1 of the present case recites:

A circuit for reducing declination errors in a liquid crystal display, comprising:
a decomposer for dividing an input signal into a plurality of signals **having at least high, medium and low brightness signals;**
at least one transient conditioner circuit including an anticipatory portion and a reactive portion for limiting signal transients between brightness levels in at least one of said medium and low brightness signals;
a delay match circuit for said high brightness signal; and,
means for combining the delayed high brightness signal with said **at least one signal transient processed brightness signal** to provide an output signal, wherein said output signal has reduced sparkle artifacts.

Amended method claim 12 of the present application recites:

A method for reducing declination errors in a liquid crystal display, comprising the steps of:
dividing an input signal into **at least high, medium and low brightness signals;**

limiting ,including an anticipatory limiting step and a reactive limiting step, signal transients between brightness levels of at least one of said medium and low brightness signals;
delay matching the high brightness signal; and,
combining said at least one limited brightness signal and said delayed high brightness signal to form an output signal having reduced sparkle artifacts.

Cited co-pending patent application

Applicant respectfully submits there is recited in amended claims 1 and 12 of the present application at least one feature that is not explicitly or implicitly recited, suggested, taught, or described in any of the claims of the cited co-pending patent application, nor can any teaching be found in the specification of the cited co-pending application, such that any obviousness rejection based upon the cited co-pending application could be sustained.

Specifically, there is no teaching or suggestion anywhere in the cited co-pending application, nor would it be obvious to one of ordinary skill in the art, upon reading the co-pending application, to:

divide an input signal into at least high, medium and low brightness signals, and limit ,including an anticipatory limiting step and a reactive limiting step, signal transients between brightness levels of at least one of said medium and low brightness signals.

Applicant's present specification teaches this unobvious feature in the specification, for example, on page 8 lines 9-25, and page 9 lines 1-4.:

"As shown in the embodiment of FIG. 1, the input signal is optionally divided into three (3) signals including a high brightness signal (H), a medium brightness signal (M), and a low brightness signal (L). When the input signal is divided into three signals, two threshold signals (Tu and Tl) are preferably used by the decomposer 12."

"When the input signal is divided into more than two signals, the "lower" brightness signals (M and L in FIG. 1) are preferably processed using additional transient

circuits as needed. In the embodiment shown in FIG. 1, the low brightness signal (L) is processed using the transient conditioner 18 to provide a processed low brightness signal and a second transient conditioner circuit 16 processes the medium brightness signal to provide a processed medium brightness signal. The transient conditioners preferably comprise an anticipatory portion and a reactive portion. The transient conditioner circuits preferably comprise at least one recursive slew rate limiter for limiting dark going transients and at least one finite response pre-conditioner for limiting bright going transients as will become apparent with reference to FIG. 2. The recursive slew rate limiter is the reactive portion and the finite response pre-conditioner is the anticipatory portion."

Applicant's co-pending claims include no such teaching or suggestion of a transient conditioner.

Accordingly, Applicants respectfully request the withdrawal of the non-statutory double patenting rejection and allowance of the claims as amended herein.

IV. Provisional Double Patenting Rejection citing 09/803,248

Atty Docket No. PU010033

Filed: 3/9/2001

The examiner provisionally rejected claims 1-17 of the present application under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-29 of co-pending Application No. 09/803,248.

Although the conflicting claims are not identical, the office action states they are not patentably distinct from each other because they both claim:

a circuit for reducing adjacent pixel interdependence in a liquid crystal display comprising
a decomposer;
a circuit for reducing adjacent pixel interdependence;
a delay match circuit and
combining means.

Claimed Invention

Amended apparatus claim 1 of the present case recites:

A circuit for reducing declination errors in a liquid crystal display, comprising:
a decomposer for dividing an input signal into a plurality of signals **having at least high, medium and low brightness signals;**
at least one transient conditioner circuit including an anticipatory portion and a reactive portion for limiting signal transients between brightness levels in at least one of said medium and low brightness signals;
a delay match circuit for said high brightness signal; and,
means for combining the delayed high brightness signal with said **at least one signal transient processed brightness signal** to provide an output signal, wherein said output signal has reduced sparkle artifacts.

Amended method claim 12 of the present application recites:

A method for reducing declination errors in a liquid crystal display, comprising the steps of:
dividing an input signal into **at least high, medium and low brightness signals;**
limiting ,including an anticipatory limiting step and a reactive limiting step, signal transients between brightness levels of at least one of said medium and low brightness signals;
delay matching the high brightness signal; and,
combining said at least one limited brightness signal and said delayed high brightness signal to form an output signal having reduced sparkle artifacts.

Cited co-pending patent application

Method claim 1 of the cited co-pending Application No. 09/803,248, as amended by applicant by amendment dated Jan 26, 2004 recites:

1. A method for reducing sparkle artifacts due to non-linearity in a transfer function of a liquid crystal imager, comprising the steps of:
decomposing (in 12) a video signal (INPUT X) for a picture into a higher brightness level signal and a lower brightness level signal;
slew rate limiting (in 22) said lower brightness level signal;
delaying (in 24) said higher brightness level signal to match a processing delay incurred by said slew rate limiting; and,
combining (in 26) said slew rate limited lower brightness level signal and said delay matched higher brightness level signal to generate a modified video signal (OUTPUT X') less likely to result in sparkle artifacts in said imager.

Apparatus claim 11 recites:

11. A circuit for reducing sparkle artifacts in a liquid crystal imager, comprising:
means for dividing a video signal for a picture into a higher brightness level signal and a lower brightness level signal;
means for slew rate limiting said lower brightness level signal;
means for delaying said higher brightness level signal to match a processing delay incurred by said slew rate limiting; and,
means for combining said slew rate limited lower brightness level signal and said delay matched higher brightness level signal to generate a modified video signal less likely to result in sparkle artifacts in said imager.

Applicant respectfully submits there is recited in amended claim 1 of the present application at least one feature that is not recited in any of the claims of the cited co-pending patent application. Nor is this at least one feature implicitly or explicitly described, suggested, taught or disclosed anywhere in the cited co-pending application, or in any prior art reference of which applicant is aware.

There is no teaching or suggestion in the cited co-pending claim, nor is there a teaching or suggestion in the specification of the co-pending application of any step or circuit directed to:

dividing an input signal into **at least high, medium and low brightness signals, and limiting signal transients** between brightness levels of at least one of said medium and low brightness signals

Applicant's present specification teaches this unobvious feature in the specification, for example, on page 8 lines 9-25, and page 9 lines 1-4.:

"As shown in the embodiment of FIG. 1, the input signal is optionally divided into three (3) signals including a high brightness signal (H), a medium brightness signal (M), and a low brightness signal (L). When the input signal is divided into three signals, two threshold signals (Tu and T1) are preferably used by the decomposer 12."

"When the input signal is divided into more than two signals, the "lower" brightness signals (M and L in FIG. 1) are preferably processed using additional transient circuits as needed. In the embodiment shown in FIG. 1, the low brightness signal (L) is processed using the transient conditioner 18 to provide a processed low brightness signal and a second transient conditioner circuit 16 processes the medium brightness signal to provide a processed medium brightness signal. The transient conditioners preferably comprise an anticipatory portion and a reactive portion. The transient conditioner circuits preferably comprise at least one recursive slew rate limiter for limiting dark going transients and at least one finite response pre-conditioner for limiting bright going transients as will become apparent with reference to FIG. 2. The recursive slew rate limiter is the reactive portion and the finite response pre-conditioner is the anticipatory portion."

Applicant's co-pending application and claims include no such teaching or suggestion of a transient conditioner. Nor is there suggestion or teaching in any prior art of which applicant is aware to provide such a transient conditioner.

Accordingly, Applicants respectfully request the withdrawal of the non-statutory double patenting rejection and allowance of the claims as amended herein.

Applicant invites the Examiner to call the undersigned if it is believed that a telephonic interview would clarify any issues raised herein.

Respectfully submitted,


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